

Zero Retries issue 0179 2024-11-22

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fourth year of publication, with ~~2200+~~ 2300+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

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Web version of this issue - <https://www.zeroretires.org/p/zero-retries-0179>

Request To Send

Commentary by Editor Steve Stroh N8GNJ

2300+ Subscribers!

The subscriber count of Zero Retries has ticked up to within a few of 2300+, so I'm calling it good enough to declare that milestone. As usual, I have no idea where the latest rush of new subscriptions came from, but news subscriptions tend to come in clumps, typically from a recommendation to a group from a current subscriber. Thanks for the vote(s) of confidence, newest subscribers!

Paid Subscribers Update

My thanks to **Jason Rausch KE4NYV** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 57** for *upgrading* from a free subscriber to Zero Retries to an **Annual Paid Subscriber** this past week!

Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.

Happy Thanksgiving!

... to all Zero Retries readers in the US this coming Thursday! In the US this holiday is observed on a Thursday making for a long weekend. It was tradition in our family just before the Thanksgiving meal to hold hands and go around the table, stating one, or a few things that we are particularly Thankful for. In that spirit, I offer some Thanks to *people* that I am particularly Thankful for, involving Zero Retries.

I'm Thankful for the 2300+ email subscribers to Zero Retries, and the many more readers of Zero Retries that follow via RSS, Mastodon, Bluesky, and pass-along personal recommendations. If there weren't readers, and a significant number of readers, there would be little point in my bleating into the void with the things I find cool and interesting and exciting in Amateur Radio and adjacent areas.

I'm especially Thankful for the more than 100 paid subscribers of Zero Retries, including the Zero Retries Founding Members (who are mentioned in every issue of Zero Retries). The paid subscribers and Founding Members who began in July 2023 have been consistently renewing their paid subscriptions and Founding Memberships in 2024. That minor financial cushion has made Zero Retries a sustainable project by it being able to "pay its own way". That minor financial cushion will be especially important in the early months of 2025 as I transition the publication of Zero Retries off the Substack email newsletter platform onto the Ghost email newsletter platform. There will inevitably be "rough patches" of migrating subscribers onto Ghost, and as for migrating payments... "there probably be dragons". To lighten the transition load, I may choose to selectively migrate subscribers as there are many subscribers who (per Substack's metrics) never seem to "engage" with Zero Retries - never or very rarely open / read it, have never clicked a link, commented, liked, etc. You'll be hearing weekly updates of the migration project as I commence it in December. The goal is for Zero Retries 0185 to be published on 2025-01-03 on the Ghost email newsletter platform. During that week, I'll (attempt) to migrate www.zeroretires.org from Substack to Ghost.

Even though I'm transitioning off of it, I'm Thankful to Substack for being an easy to use, free to start, email newsletter publishing platform. Had Substack not been easy to use, free, and accepting anyone who wanted to try an email newsletter in mid 2021 when various elements of my life aligned to facilitate starting Zero Retries, we may well not be having this discussion in late 2024.

I'm Thankful for all the inspirations that have formed my mental model of what Zero Retries could be, and should be, and the Zero Retries Pseudostaffers. In particular, I'm Thankful for very regular feedback and commentary of Pseudostaffer Jeff Davis KE9V, Dan Romanchik KB6NU, and especially my partner in podcasting Kay Savetz K6KJN, who I now count as a friend and confidante. Those three offer me regular commentary and feedback. I'm also grateful to Cale Mooth K4HCK who publishes Amateur Radio [Weekly](#) (and [Daily](#)...) and Tom Salzer KJ7T who publishes [The Random Wire](#). Both publish weekly and both regularly spot Zero Retries Interesting items, or create original articles, that I otherwise would not be aware of.

I'm also Thankful to a special friend of decades now, "D", who prefers to stay mostly behind the scenes. "D" regularly offers me "upside the head... *but gently*" feedback and comments when they think I need it (and they're usually right).

I'm Thankful that I was blessed beyond reason to be born in the US, in this era of incredible technological and social progress with incredible prosperity of average citizens, to parents and step parents, and adoptive parents who provided well for me and my brothers, provided the educations of our choosing, help with our early adult lives, and unfailing encouragement and Love.

Above all related to Zero Retries, I'm Thankful for my wonderful wife of 40 years, Tina (KD7WSF) who has supported me in Zero Retries in love, and with patience and support completely beyond reason. I'm also grateful to my wonderful daughter Merideth (KK7BKI) who I look forward to communicating with on the air in 2025 now that her new house is mostly organized and ready for some new radios and antennas to be installed.

The Planned Christmas Issue of Zero Retries (0183)

It's not exactly a Zero Retries tradition quite yet (I did a story in Zero Retries 0079, but not in time for Christmas that year), but I plan Zero Retries 0183 to be entirely a short story about my hopeful view of Amateur Radio by the end of this decade. I will tell the story from the perspective of a young Amateur Radio operator, explaining why she is interested and active in Amateur Radio, to a teenage girl who has become curious about radio technology. For this story I'm inspired by a similar experience I had in my teenage years with my late Pastor, Harry Holzapfel WA0ROI (Silent Key), who was the only Amateur Radio Operator other than my childhood friend in techie experimentation Bob Kreutzfeld (now) KS8E to reach out to me to demonstrate Amateur Radio to me.

Have a great weekend (and a Happy Thanksgiving), all of you co-conspirators in Zero Retries Interesting Amateur Radio activities!

Steve N8GNJ

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What's New at Digital Library of Amateur Radio & Communications — November 2024

By Kay Savetz K6KJN

Ooh la la and vom amo da, it's a very international What's New at DLARC, with new material added to the free online ham radio library from soviet Russia, France, and New Zealand.

This first new collection is amazing, one-of-a-kind material that's never been available online before (and was barely available to anyone offline, either.) This is the kind of thing that makes me proud to be curator of DLARC, and it comes with a great story.

The [Translations of Russian Amateur Radio Publications](#) collection offers English translated summaries of the Soviet amateur radio publication "Radio" and radio-related articles in the Sovetskiy Patriot newspaper. These summary translations were done by Dexter Anderson (K3KWJ, W1STN, W4KM) as a way to practice his Russian language skills. He did this privately, on his own time, and circulated them to a few hams and DXers that he knew.

Fred Laun (K3ZO) was one of those friends, who meticulously kept every issue that he received. The typewritten pages cover Russian publications from June 1979 through the end of 2000. Now 24 years later, Dexter Anderson's 20-plus-year hobby provides unique insight into the world of amateur radio in

Russia during and after the cold war.

These 120+ summary documents (some just a page or two long, some a dozen pages or more) provide fascinating glimpses into the world of radio at that time and place.

For instance, the September 1980 article "[Struggle for Clean Airwaves](#)":

In my work I monitor frequencies used to report on urgent situations at sea. I think there's no need to explain why strict observance of radio discipline is necessary when people's lives may be at stake due to a sinking ship. Nonetheless a day doesn't go by when the "operation" of radiohooligans is not heard on these frequencies 1600-3800 kHz. Radiohooligans, as a rule, do not heed a request to terminate operation. On the one hand they apparently feel they can't be caught or punished, and on the other hand by no means every illegal can hear official stations, since he is operating with AM (if you can call what takes place within his homemade equipment "modulation") and the official stations are using A3A or A3J. But this can in no way serve as an excuse, since the issue here is not receiving technology but the unacceptability of the existence of radiohooliganism in general. One has the impression that in a number of places the fight against radiohooliganism is being waged not actively enough, that counter-measures are not being taken, publicity is not being used, that the public is not being brought in to the struggle. And yet radioamateurs could be of great help to the organs of radiocontrol. I believe "foxhunters" could be brought in in the fight against radiohooligans. Those wishing to become radioamateurs and to receive individual call-signs could be included in raids in the cities and oblasts. Let this form of work for society become one of the deciding factors for passing upon applications for call-signs or higher grades of license.

(I now love the word radiohooligans, which definitely should be used more.)

Last year I put out a call for help here in Zero Retries for someone fluent in French who could help sort out contact information for the publishers of French radio magazines. Grégoire SA6DTZ offered his assistance and helped find the person behind Soracom, which published several radio mags. Soracom is out of business but publisher Florence Faurez F6FYP gave permission to include in DLARC [Megahertz Magazine](#), [ABC Electronique](#), and [ABC de la CB](#).

With her gracious approval, DLARC has every issue of [Megahertz](#), which covered amateur radio, amateur television, microcomputers, electronics, and related topics; I *think* every issue of [ABC Electronique](#), which covered the basics of building electronics; and just three issues of citizen's band radio mag [ABC de la CB](#). (We are missing issues of that one, I've added it to the [DLARC Wantlist](#).) Megahertz is the jewel of the bunch: the magazine ran from 1982 through 2008. I can't read French, but do enjoy looking at the photos and diagrams of radios and home computers.

In what seems like an unusual business pivot, Mme Faurez told me they stopped publishing activity in 1995 and converted to dog breeding, focusing exclusively on the Coton de Tulear breed.

If you need even more radio magazines in French: DLARC also has [Ham-Mag](#) and [Ondes Magazine](#).

We added [308 issues of Break-In](#), the journal of the [New Zealand Association of Radio Transmitters](#). I received the issues, some on paper and some on CD-ROM, from the estate of Bob Cooper, who lived in New Zealand for many years. NZART is a membership organization, so I reached out to them for permission to make their magazine available in DLARC. They graciously gave their OK, with the caveat that the magazine would be available for reading online, not downloadable. That's something Internet Archive can do. So, thanks to Coop and NZART, issues spanning January 1974 through December 2010 are available for your perusal. You'll need a [free Internet Archive account](#) to read them.

Finally, closer to home (my home, at least) DLARC also added [162 issues of "The Heterodyne"](#), the newsletter of the West Valley Amateur Radio Association, based in San Jose, California.

Digital Library of Amateur Radio & Communications is funded by a grant from Amateur Radio Digital Communications ([ARDC](#)) to create a free digital library for the radio community, researchers, educators, and students. If you have questions about the project or material to contribute, contact me at kay@archive.org.

***Editor's Note** - DLARC is an absolute treasure of Amateur Radio and I consider DLARC indispensable in my work writing and editing Zero Retries. This month's column demonstrates that DLARC, despite being sponsored by a US organization, is attempting to be a repository for all things Amateur Radio worldwide. Thank you to Kay for their hard and sustained work in making DLARC to be a more usable and more complete archive of Amateur Radio worldwide... despite some ongoing significant impediments (that aren't necessary to go into at the moment).*

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Explaining the Use Case for Data Over Repeater - Part 1

By Steve Stroh N8GNJ

*In **Zero Retries 0175** - MMDVM-TNC is (Kind of) Real, I wrote:*

*I plan to do a future article in Zero Retries - **Explaining the Use Case for Data Over Repeater**, about why such a data capability is important.*

Clinton Blackmore VE6CWB recently sent me an email, which I'm reprinting here with his permission. I'm including explanations to his questions because he asked some good questions which help me frame the longer discussion that will be Part 2.

It seems like you've mentioned MMDVM repeaters a fair bit recently in Zero Retries - enough that it's caught my attention.

I'm happy to wait for your forthcoming explanation - "Explaining the Use Case for Data Over Repeater" - promised in ZR 0175. In preparation for that article, I have a few questions and I hope you'll answer address them.

It sounds like you might add data transmission as a supplement to regular repeater activities. Would it just be using the repeater for data some of the time and voice at other times? Or would you imagine having extra frequencies (or wider bandwidth) for the repeater?

The very easiest mental model for the usage of a mixed mode FM voice / MMDVM-TNC data repeater is that hundreds or thousands of mixed mode repeaters *already exist and are deployed and in use...* it's just that the "data" capability of those repeaters is "fixed formatted" into digital voice (which in the end, is transmitted as data, not conventional FM voice). Example:

- Yaesu kickstarted the widespread deployment of mixed mode repeaters in the US with their DR-1X and now their [DR-2X](#) repeaters - FM voice and System Fusion digital voice (with a little bit of data).
- Icom's [current D-Star repeaters](#) are mixed mode - FM voice and D-Star digital voice (with a little bit of data).
- Hytera's DMR repeaters are mixed mode - FM voice and DMR digital voice.

All of these repeaters listen on the input frequency for FM voice *and* (their flavor of) digital voice, and then...

- When an FM voice signal is received, the repeater transmits FM voice.
- When a digital voice signal is received, the repeater transmits digital voice.

"Data capability" on D-Star, System Fusion, DMR, and P25

It's a completely different discussion, perhaps meriting a detailed treatment at some point in the future, but D-Star, System Fusion, DMR, and P25 digital voice modes all incorporate some limited data capabilities. Thus with the installation of a new mixed mode D-Star, System Fusion, DMR, or P25 repeater, there (could have been) a data capability "built in". Thus you might consider this entire discussion of mixed mode repeaters (FM voice / MMDVM-TNC data) to be moot.

However, in my studies of the data capabilities of all of these systems, the data capability in those systems is an afterthought at best, or only partially (poorly) implemented or in the case of System Fusion, deliberately limited. Not to mention the data capabilities in these systems is now far behind the current state of the art, such as no use of Forward Error Correction (FEC) for data.

Thus, to add good, reasonably fast data capability to a repeater², Amateur Radio has to invent new technology, such as adding an MMDVM and incorporating MMDVM-TNC data, or perhaps M17 or Opulent Voice. All of these new systems have a well-implemented data capability in addition to digital voice.

If I receive enough feedback that Zero Retries readers want to read a detailed critique of the limited data capabilities of D-Star, System Fusion, DMR, and P25, let me know.

...

Thus, what I'm proposing with retrofitting FM voice repeaters, continuing the primary use of an FM repeater's existing voice operations, and adding an MMDVM to support a secondary use of MMDVM-TNC data is *conceptually the same* as what we've been doing for years on hundreds or thousands of existing mixed mode repeaters.

My observation over decades of promoting the conversion of little-used FM voice repeaters for 9600 bps FSK data (and creation of new such repeaters) is that *no repeater owner is willing to do so*. The idea of "data repeaters" is just completely foreign and not understood, and there are only historical examples to cite such as [The Puget Sound Amateur Radio TCP/IP Network](#). Thus a scheme like adding MMDVM and the subsequent ability to *also* use MMDVM-TNC data, that can (theoretically) switch seamlessly from FM voice to MMDVM-TNC data will likely be better received.

Extra frequencies is an interesting idea, especially if the repeater could receive on another input channel, possibly on another band. I'm not currently promoting wider bandwidth, though I'm definitely promoting the preservation of current (non-narrowband) channels.

Also, I'm dying to know, as transmitting data over a repeater in an infrastructure-up situation doesn't make a lot of sense (vs. downloading files from the internet) unless you hope people skill-up and can use it in an infrastructure-down situation. What sort of data might one transmit? (I seem to recall you saying something about FLArq in this vein, too).

In an "infrastructure up" (*neat descriptor!*) situation, I'm positing using a repeater in data mode in the same way we currently use a repeater for voice. In "infrastructure up" situations, we certainly don't *need* to use repeaters for voice communications - we have mobile phones and mobile phone networks for any conceivable voice needs.

The "broadcast files" capability I referenced is actually [flamp3](#) which stands for **Fast Light Amateur Multicast Protocol**. flamp is one of the fldigi suite of data modes. Literally any useful file can be distributed via flamp - maps, weather bulletins, repeater / node frequencies (code plugs), local Amateur Radio events and nets calendar, club bulletins, photos, even rudimentary web pages - pure HTML is remarkably compact. If you have a receiver on the flamp frequency, even a computer as simple as a Raspberry Pi Zero 2 W is usable for this purpose, and there's no transmit capability required. Thus Amateur Radio clubs could use flamp to distribute information to those interested in Amateur Radio. The basic point is that with flamp, we can *use* Amateur Radio to *promote* Amateur Radio, similar to the way we use nets and HF chats to promote Amateur Radio to folks who might be listening to learn what Amateur Radio is all about. And yes, this capability is "legal" - this sort of one way information transfer is well within the category of Amateur Radio "bulletins".

My other question about retrofitting repeaters is, um, well, again about frequencies and slots. It seems you are suggesting we could upgrade to digital radios from analog ones using existing repeaters without leaving behind users with older tech, but how?

Ben Foght N5AMD wrote a great article on the hardware installation of an MMDVM into a repeater - [How to make a MMDVM Digital Repeater](#). For the purposes of adding data capability (MMDVM-TNC), the MMDVM hardware merely has to get updated to add MMDVM-TNC as another mode, just like you would add another digital voice mode to an MMDVM, such as M17. Then the repeater passes FM, or digital voice, or MMDVM-TNC data. MMDVM-TNC is still experimental - it's not currently in the main software distribution for MMDVM, so actual experience with it in the real world is a work in progress, and this is one of the many projects I have queued up for my test repeaters in N8GNJ Labs to get some real experience using MMDVM-TNC and "mixing and matching" FM voice operations and MMDVM-TNC data so I can advise from actual experience.

I could see a repeater identifying an input signal as analog FM or some digital mode ... but then it surely needs to transmit an FM audio signal out. (Admittedly, there's a couple of people with poor signals, who, if they could use digital modes with forward error correction, would probably come through way better). I assume the digital radios don't want to listen to analog FM signals, though. I could imagine a repeater

using two pairs of frequencies, one for digital radios and one for analog, and mirroring messages between them, but that sounds like extra expense and gear and getting repeater area authorities to allocate additional frequency pairs -- which, which not insurmountable is not an easy upgrade.

Speaking of “repeater identifying...”, a longstanding, very widespread “missed opportunity” in Amateur Radio repeaters is that current generation repeater controllers can “ID” and transmit voice bulletins with *high quality digitized voice*, either recorded human or pleasant sounding artificial (AI) voices. Thus the repeater can, perhaps hourly, provide a rotating set of voice bulletins about the repeater’s various capabilities, upcoming nets, etc. Personally, after four decades now of listening to very low quality artificial voices to ID repeaters, any repeater that I have any influence on will not use such crappy voice, with the subsequent crappy impression to prospective Amateur Radio Operators.

At the moment, we don’t have “digital radios”, at least for practical use (reasonable transmit power). Thus what we’re using is conventional FM radios with data modems (formerly known as TNCs) attached. What we’re calling “data radios” are conventional FM radios with a special input, called, variously, “flat audio”, “data jack”, “9600 input”, etc. that can be used to bypass the conventional voice pre-emphasis and voice de-emphasis stages of the radio that make human voice sound good on an FM radio, but distort higher speed data “audio” that is sent through those stages.

The data modems are endlessly patient, and will happily listen to a mixed mode (FM voice / MMDVM-TNC data) repeater, and only “spring into action” when it actually decodes an MMDVM-TNC transmission.

All of this would be much easier explained in an interactive block diagram, which I intend to do eventually. I have not yet spent time learning how to instruct an AI like ChatGPT to create such diagrams, even videos, but that’s on my long to-do list.

There are endless refinements possible for mixed mode repeaters.

For one, consider the possibility of adding a secondary receiver to a mixed mode repeater. Imagine a 146.76 MHz FM repeater, with its input frequency at 146.16 MHz. This repeater gets retrofitted with an MMDVM and a secondary receiver, perhaps even on a different band like 222.01 MHz. When someone transmits FM voice on the primary input frequency, FM voice is retransmitted like normal. When someone transmits MMDVM-TNC data on 222.01 MHz, that data is routed into the MMDVM and recognized as MMDVM-TNC data, and is retransmitted as MMDVM-TNC data.

Another potential refinement for mixed mode operation is that most current repeaters can be configured to transmit a subaudible tone when the repeater transmits in FM voice mode, and a FM user radio can be configured to mute the audio unless that subaudible tone is received. A digital voice radio will generally automatically switch between FM voice and digital voice.

Part 2 Upcoming - First Principles of Mixed Use FM voice / MMDVM-TNC Data Repeaters

In Part 2 that I’ll publish in the next week or two, I’ll discuss the following ideas (“First Principles”) in more detail:

- Amateur Radio capabilities, during normal (non emergency) times is generally inferior to the capabilities of commercial (and public safety / government) Internet / cellular / satellite services. What Amateur Radio can do better than Internet / cellular / satellite is personal experimentation and training / learning with radio technology, some research, and some recreational activities.
- Why do we in Amateur Radio VHF / UHF operating want to use repeaters at all? Because repeaters allow wide-area communications by limited power / limited antenna stations over widely varying terrain. In a phrase, using a repeater “levels the playing field” for all stations, including portable radios, mobile radios, and base stations. It’s generally easier, more effective, and provides a more satisfying experience to use a repeater instead of simplex communication on VHF / UHF.
- Why do we need data capabilities in Amateur Radio at all, including repeaters? Again, personal experimentation and training / learning with radio technology, some research, and some recreational activities. Some would argue that we need to be able to use data capabilities in Amateur Radio for communications in emergency conditions that increasingly require data capability rather than voice. Example, distributing the occupancy list of a mass casualty shelter when a hurricane has wiped out terrestrial infrastructure including power and mobile networks. It just doesn’t work to try to read hundreds of names, accurately, via voice.
- Why not use (single channel, store and forward) digipeaters for data operations instead of repeaters? Generally, for the same reason we don’t use single channel store and forward (simplex) voice repeaters - the experience is poor in comparison to a realtime full duplex repeater.
- Isn’t using a repeater a “single point of failure”? Yes, but we don’t seem to consider that an issue for voice operations... and we have a lot of (redundant) repeaters to switch to if one fails. Not to mention we know how to quickly stand up a temporary or emergency repeater.
- In the 2020s, increasingly many... *arguably most*, repeaters have gotten quieter and quieter with less and less usage⁴. In past decades, we used repeaters a lot, for example, for autopatch (some repeaters were built exclusively for autopatch). But now, we don’t use repeaters nearly as much. Thus these “almost entirely quiet repeaters” aren’t widely used. Thus does it make sense to continue supporting repeaters that are barely / rarely / almost never used? Wouldn’t it be a better use of such a repeater to adapt it for data use with an MMDVM and add MMDVM-TNC data capability? Ditto for repeaters that are unused during certain times such as late evening / early morning? Computers and data communications are “patient” and can wait.
- Why do a disruptive hardware change of installing an MMDVM when a repeat owner could allow an unmodified repeater to be used with VARA FM or conventional 1200 bps AFSK packet radio, or perhaps a newer packet radio mode such as what’s possible with a NinoTNC? That’s a fair point worth discussion... but generally such operations are disruptive to normal operations on the repeater - FM voice users will hear “a lot of garbage” on the repeater when data modes are in use.
- What’s so special about MMDVM-TNC? Why is it worth considering converting a repeater to support it? I posit MMDVM-TNC is worth considering because it is a well-designed, fast data mode that can be run from an MMDVM, and MMDVMs have already been successfully implemented by existing repeaters (initially, for digital voice operations). MMDVM-TNC uses a robust modulation method, uses an advanced Forward Error Correction (FEC) system (IL2P), and offers different speed tiers, with a minimum 9600 bps, and potentially as fast as 38400 bps, exceeding the 25 kbps possible with VARA FM.
- What if we do go through a disruptive upgrade to add an MMDVM and “something better comes along” and we have to do it all over again? That’s quite possible, and it’s *likely* that “something better *will* come along” in the next few years. But that “new thing” will likely be a highly capable software modem that will connect the same way as the MMDVM, include all the existing MMDVM functions including MMDVM-TNC, and much more.

- And much more, including some examples of what we can do with a real Amateur Radio data infrastructure. Hint - look at what's already being done with user-accessible Amateur Radio microwave networks such as HamWAN and AREDN.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Recommended Units for a New AREDN User

Zero Retries Pseudostaffer and AREDN Ambassador Orv Beach W6BI, [in response to some questions](#) about which microwave radio to buy for a new user to connecting to an AREDN microwave network:

The Mikrotik, AC Lite is one or two generations back. While it's supported by AREDN software, a more future-proof purchase would be the Mikrotik hAP ac3. It's better, faster, more RAM, etc. The only downside is that it's almost twice as wide as the AC Lite.

Again with the Ubiquiti Powerbeam 400, it's the older 802.11n hardware, which vendors are phasing out. A better purchase would be one of the 802.11ac devices in the AREDN Supported Devices list: <https://www.arednmesh.org/content/supported-devices-0>

And yes, all the devices on that list will talk to a Mikrotik hAP.

New Products from Masters Communications

[Masters Communications](#) offers an extensive line of products that enable Zero Retries Interesting data modes in Amateur Radio, including VARA FM "at full speed". Thus MC's new products always merit a mention in Zero Retries. This information is from a pair of emails ([1](#), [2](#)) on the DRA email list and was lightly reformatted for publication.

- **DIN6-164 Cable**

The [DIN6-164 Cable](#) is a 2.5' cable connects Mini-DIN-10 equipped [Yaesu] radios to Mini-DIN-6 equipped radio interfaces and mixers.

This cable is used in replacement or substitution for a Yaesu CT-164 adapter and additional male-to-male cable. The DIN6-164 Cable doesn't require anything extra - it has the proper connectors on each end.

The DIN6-164 cable is 30 inches long, and is great for directly connecting a DRA-50 or DRA-50M to most Yaesu FTM Series radios (except FTM-350).

- **RA-47M - AllStar Link and Digital Data Radio Interface (sound card)**

The [RA-47M](#) is a highly versatile interface providing full support for AllStar Link, Echolink, and Digital Data. It has a Mini-DIN-6Radio Port - unlike any other RA device. It's compatible with the DIN6-164 Cable and provides a nearly plug-n-play solution to making a quality simplex ASL or Echolink node, or digital data relay from Yaesu FTM radios. It can be used with our DRAC-12 or DIN6-Shortie on MD6 equipped (or adapted) radios. COS status is available on the rear panel (like a RA-42M). The COS / CTCSS logic header allows pin 6 of the radio connector to be steered to COS or CTCSS or NONE - giving compatibility to ASL, Echolink and Digital applications. The RA-47M has amplified TX audio and provides sufficient level for full 5kHz deviation on voice applications. The COS status LED is a feature of AllStar Link, and does not currently work with other applications.

Think DRA-50 with a COS LED and multi-mode squelch logic selection header.

- **RA-25M and RA-35M - expansion of the RA "M" Series**

The [RA-25M](#) and [RA-35M](#) are metal case versions of these popular RA boards. There are no differences in functionality or performance compared to their standard counterpart, but the M boards are larger, easier to configure, and put all LEDs on the front panel, and provide a relay / transistor PTT keying option. These boards eliminate the adapter rails and are now provided by default when the RA-25 or RA-35 is ordered in a metal case. I still have some web work to finish - but all standard RA documentation applies to these two new products.

- **Kenwood-25 Adapter**

Masters Communications was recently tasked with making another accessory port adapter - this time for some commercial Kenwood mobile radios.

The Kenwood TK-790 / 890 and TK-7180 are popular commercial radios that can be programmed on Amateur frequencies and they perform well. They have the necessary connections to connect sound card interfaces through their DB25 accessory port jack. To make this connection easier - Masters Communications has designed and now offers the Kenwood-25 Adapter which bolts to the DB25 and converts this connection to a Mini-DIN-6 female (MD6 female). This allows any MD6 equipped sound card to be easily connected with inexpensive pre-made cables like our DRAC-12 and DIN6-Shortie - no soldering required.

These two series of radios use a different pin for transmit audio. A simple mechanical 3-pin header / jumper selects which pin gets connected - no soldering required. Two screws are supplied to properly fasten the adapter board to the radio.

Full details and secure online ordering is available here:

[Kenwood-25 Adapter](#)

I have regularly heard good things about the use of Kenwood TK-790, TK-890, and TK-7180 radios. They're widely used in commercial and public safety use, they're widely available used at reasonable prices, and apparently pretty reliable even when bought used. The primary issue that (again, that I've heard) that prevents them from being more widely used for data communications in Amateur Radio is the availability of programming software and the general knowledge of which variants have which features that are significant.

[The Day The Clocks in the US Were Synched Up](#)

This is a great story from historian Heather Cox Richardson that might seem a bit tangential to normal Zero Retries content, but I think it's Zero Retries Interesting.

This story is, to me, simultaneously geeky, riveting, and just a fascinating slice of history. It's rare that you can look back to a specific moment in history... a specific *hour*, for such a dramatic change in society. With cell phones and Internet, we now take time synchronization to the second for granted... but how did they do it "back in the day", and especially what was it like before then? Hint - sundials... yes, *really*.

I often say that 1883 is my favorite year in history because of all that happened in that pivotal year, and one of those things is the way modernity swept across the United States of America in a way that was shocking at the time but that is now so much a part of our world we rarely even think of it....

Until November 18, 1883, railroads across the United States operated under 53 different time schedules, differentiated on railroad maps by a complicated system of colors. For travelers, time shifts meant constant confusion and, frequently, missed trains. And then, at noon on Sunday, November 18, 1883, railroads across the North American continent shifted their schedules to conform to a new standard time. Under the new system, North America would have just five time zones.

[WB2CBA DX-FT8 FT8 Multiband Tablet Transceiver](#)



Image courtesy of Barbaros(Barb) Asuroglu WB2CBA - from GitHub

DX FT8 TRANSCEIVER PROJECT is a collaboration between Charles (Charley) Hill, W5BAA and Barbaros (Barb) Asuroglu, WB2CBA.

...

DX FT8 is an OPEN SOURCE PROJECT.

DX FT8 is a FT8 Digital mode capable HF QRPp GUI (Graphical User Interface) based multiband Transceiver.

DX FT8 is abbreviation for Digital Xceiver for FT8.

Main aim of DX FT8 Transceiver Project is to create a highly portable stand-alone FT8 GUI Transceiver. Stand-alone aim is to create a user interface for working FT8 digital mode plus Multiband transceiver packed into one unit.

This creates an advantage for carrying one GUI based FT8 operation capable Transceiver unit and no longer needs to carry a PC or a laptop or

tablet for GUI interface operation for FT8 with a classic transceiver.

...

DX FT8 Transceiver operates on 5 HF bands. These bands are:

1. 20m (14.074 MHz)
2. 17m (18.100 MHz)
3. 15m (21.074 MHz)
4. 12m (24.915 MHz)
5. 10m (28.074 MHz)

This is a sweet little *Zero Retries Interesting* low power, highly portable HF radio. In reading the project goals, the creators really nailed those goals and created a really elegant radio. I'm really glad that the creators arranged for a low-price kit to be able to more easily build this radio.

My thanks to [Amateur Radio Weekly Issue 355](#) for alerting me to this project.

[Apple Satellite Connectivity Group is Hiring!](#)

Matt Ettus M2MJI, Technical Leader and Co-Founder of Satellite Connectivity Group at Apple on LinkedIn:

My team (the Satellite Connectivity Group) at Apple is hiring! We're looking for great engineers in the SF Bay Area, San Diego, Austin, and Madrid to work on protocols and software for wireless communications, software validation, and backend systems software. Come work with the people who brought the world SOS/SMS/iMessage-over-Satellite, iMessage over satellite.

The linked job posting is for a Wireless Protocol Engineer. To see the Zero Retries Interesting connection about this job, and the group, see **Zero Retries 0064** - The "Kind of" Amateur Radio Backstory of Apple's "Emergency SOS Via Satellite" Feature.

[New Yaesu FTM-150RASP "Data Radio"](#)

Making the rounds on various YouTube channels and other Amateur Radio media:



Image courtesy of Yaesu

We are pleased to introduce the new 55W (VHF) / 50W (UHF) FM Dual-Band Mobile Transceiver FTM-150RASP.

55/50W 144/430MHz FM Dual Band Mobile Transceiver

With the New Evolving Super-DX and Audio Digital Signal Processor

The FTM-150RASP provides true dual band operation with two different receivers on different bands or within the same band (V+V, U+U, V+U, U+V). Full Dot-Matrix display is graphically visible and provides a clear and crisp view of the radio operating status. Front panel is detachable, and by attaching the optional swing-head - SJMK-500, flexible angle adjustment is possible to accommodate easy mobile operation.

The power output is 55W on VHF and 50W on UHF (55W / 50W, 25W, 5W is selectable). Heavy Duty Heat Sink with FACC (Funnel Air Convection Conductor) ensures stable and reliable transmit power.

There were two other new Yaesu radios announced at the same time, but the FTM-150RASP is Zero Retries Interesting because it offers a flat audio connection for use with higher speed data modems and thus "full speed" for data modes such as VARA FM. But the connector is a Yaesu proprietary 10-pin MiniDIN connector, and thus the Masters Communications DIN6-164 Cable, mentioned above, is timely and a better and less expensive option for connecting data modems to the FTM-150RASP and other Yaesu radios with this proprietary connector.

It's notable, and commendable, that Yaesu is apparently paying attention to the data market as this is the second new radio in two years that include a flat audio connection. No other manufacturers are doing so, thus kudos to Yaesu!

[SharkRF MIKE](#)



*Bring the whole world in your pocket
with the M1KE!*



Image courtesy of SharkRF

Forget hotspots!

Enter the digital radio world with the new M1KE!

The M1KE is our latest battery powered, handheld WLAN IP transceiver designed for both amateur radio and unlicensed use. Besides chatting with other M1KE users nearby, you can talk to people living on the other side of the world very easily.

Compatible digital radio networks:

- Supports direct communication with other M1KE devices (no internet connection or wireless infrastructure needed)
- Supports multicast communication with other M1KE devices over the connected wireless network
- DMR networks (BrandMeister, DMRplus, DMR-MARC, Phoenix, XLX, TGIF and others)
- XLX, DCS, REF/DPlus, XRF/DExtra
- FCS, YSFReflector
- NXDNReflector
- DAPNET
- APRS-IS
- Custom private networks (built-in support for broadcast/multicast gateway operation and site linking over the internet)
- Custom private servers (SharkRF IP Connector)

This... is cool and very Zero Retries Interesting. ~~No price was stated~~ - **Update** - see the ["Shop" page for this item for pricing](#) (349,00 €) and to be notified when it's available, but it's cool enough that they're going to be busy making many multiple batches of these. And I'll guess that the idea will be quickly

cloned. I'm out of "fun funds" at the moment, but if I had some, I'd want to buy this.

As I stated a while back, I have no angst about this being "radio over Wireless LAN" (Internet). I can see endless ways to experiment with this. One feature that leaped out at me is the ability to (as I read it) go peer to peer over a Wireless LAN, so my wife and I can easily do an intercom function over the shared Wireless LAN between N8GNJ Labs and our house, despite N8GNJ Labs being a very effective Faraday Cage, and thus portable radios between the two don't work very reliably.

Another thing I like about it, and I think will quickly become very popular is the ability to (again, as *I read it* - "Custom Private Servers") to be able to use it for small group communications without needing to involve a network entity like Brandmeister. I can quickly imagine the Zero Retries group chat server.

Honestly, I like that the M1KE cuts out the complexity of involving an Amateur Radio portable radio (hotspot) for casual voice communications via Internet, integrating all that complexity down to one handheld device. I can easily imagine a future variant with no integrated speaker / microphone that uses a popular pinout for a portable radio speaker / microphone.

In fact, the only one I can imagine that has reason not to like this device is [Martin Kemp, M1KE](#), who doesn't seem to have any connection to SharkRF or Radio Over Internet communication. While it's a clever product name, SharkRF might have applied a bit more thought in naming a product for a callsign that's actually in use. If I were in charge of marketing at SharkRF, the real M1KE ought to be queued up to receive the very first production unit, gratis.

[Starlink Internet Speeds Could Skyrocket to 2 Gigabits Per Second](#)

Cord Cutters News:

SpaceX President Gwynne Shotwell has announced ambitious plans to dramatically increase Starlink internet speeds, potentially reaching a blazing-fast 2 gigabits per second. This would be a significant leap from the current average speeds experienced by users, marking a major milestone for the satellite internet service.

Next-Generation Technology

Shotwell revealed these plans at the Annual Baron Investment Conference, highlighting advancements in Starlink's technology. "The next generation will have smaller beams, more capacity per beam, lower latency," she explained, suggesting significant improvements in the satellite network's capabilities per a report [from] Cnet.

While Zero Retries isn't the "Starlink is Cool" newsletter (that's a project for next year), I mention this to illustrate how incredibly fast *radio technology is evolving in this era!* I just chuckle every time some technical expert pronounces that Starlink won't be able to scale to some arbitrary milestone of performance, or number of users, or geography, or sharing with other systems, or *whatever*. Inevitably, they're wrong because they're calculating some steady state in technology and not imagining exponential improvement now occurring daily in radio technology. In Starlink, SpaceX is innovating in radio technology at a scale that no other entity can match.

Somewhat related is that Starlink is being used for high bandwidth telemetry on all the SpaceX Starship launches, including streaming video for us online launch groupies. Imagine the qualitative advantage that gives SpaceX in iterating its design of Starship, and how "left in the dust" that leaves every other rocket launch provider and manufacturer that doesn't use Starlink.

Radio technology is now endlessly adaptable with exponential advances not just in the radio hardware, but now the antennas are evolving at nearly the same speed because the antennas are being actively managed, millisecond by millisecond, with digital technology. I never expected that phased array antenna technology would be affordable by consumers, but now I'm composing this text on a remote Internet server, using one.

The Starlink satellites feature improved technology and capabilities almost with every launch... and it seems plausible that the SpaceX Starship will do its first non-development flight in 2025, quite possibly with the larger, more capable [Gen 2 Starlink satellites](#).

Leave a comment

Share

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything!*
- **Annual Founding Members who generously support Zero Retries financially:**
Founding Member 0000 - Steven Davidson K3FZT (Renewed 2024)

Founding Member 0001 - Randy Smith WU2S (Renewed 2024)
Founding Member 0002 - Chris Osburn KD7DVD (Renewed 2024)
Founding Member 0003 - Don Rotolo N2IRZ (Renewed 2024)
Founding Member 0004 - William Arcand W1WRA (Renewed 2024)
Founding Member 0006 - Todd Willey KQ4FID (Renewed 2024)
Founding Member 0007 - Merik Karman VK1DF / VK2MKZ (Renewed 2024 *with two Founding Member subscriptions!*)
Founding Member 0008 - Prefers to Remain Anonymous 14 (Renewed 2024)
Founding Member 0009 - Prefers to Remain Anonymous 19
Founding Member 0011 - Rick Prelinger W6XBE (New 2024)
Founding Member 0012 - Ryan Tolboom N2BP (New 2024)

- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your [QRZ](#) page (or other web presence) and include a link:

<https://www.zeroretires.org>

- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- [Dan Romanchik KB6NU](#) mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Jeff Davis KE9V](#) also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Amateur Radio Weekly](#) by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories that often feature "Zero Retires Interesting" topics.
- [Experimental Radio News](#) by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- [RTL-SDR Blog](#) - *Excellent* coverage of Software Defined Radio units.
- [TAPR Packet Status Register](#) has been published continuously since 1982.
- [Hot Iron - The Journal of the Constructor's Club](#) is a delightful quarterly newsletter.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- [HB9BLA Wireless](#) by Andreas Spiess HB9BLA
- [KM6LYW Radio](#) by Craig Lamparter KM6LYW (home of the [DigiPi project](#))
- [Modern Ham](#) by Billy Penley KN4MKB
- [Tech Minds](#) by Matthew Miller M0DQW

These podcasts regularly feature Zero Retries Interesting content:

- [Store and Forward](#) - a podcast about the past and future of amateur radio, by Kay Savetz K6KJN (curator of the [Digital Library of Amateur Radio and Communications](#)) and Steve Stroh N8GNJ (Editor of Zero Retries).
- [Ham Radio Workbench](#) by George Zafiropoulos KJ6VU (and friends)
- [Foundations of Amateur Radio](#) by Onno Benschop VK6FLAB

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ~~2200+~~ **2300+** other subscribers:

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Offering **feedback or comments** for Zero Retries is equally easy — just click:

Leave a comment

If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Social Media:

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

[Zero Retries / N8GNJ on Mastodon](#)

Zero Retries (N8GNJ) is also on Bluesky — [@n8gnj](#) — just click:

[Zero Retries / N8GNJ on Bluesky](#)

Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) — *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs in Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

2024-11-22

Blanket permission is granted for TAPR to use any Steve Stroh content in Zero Retries for the TAPR Packet Status Register (PSR) newsletter (I owe them from way back).

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Footnotes for this Issue

[1](#)

The things you can find if you only think to look 😊. I have not thought about my old Pastor Harry Holzapfel WA0ROI (Silent Key) from my childhood in Port Clinton, Ohio in decades, and I didn't (think) I had a prayer of finding his callsign without resorting to a long search in old callsign books. But it was worth attempting a quick web search and quickly found the QRZ page of [Richard Budd W0TF](#) who relates *his* history with WA0ROI. W0TF now owns WA0ROI's Kenwood TS-520 HF radio which WA0ROI used in his demonstration to me.

As I've related, in snippets over the years, my intense, active interest in Amateur Radio was only triggered in the mid 1980s by the development of Amateur Radio Packet Radio which combined the three intense technical interests of mine - microcomputers, data communications, and radio. Thus WA0ROI's demonstration wasn't quite enough to get me actively interested in Amateur Radio... that, and being discouraged by my Dad who didn't relish the prospect of what he thought of as an expensive hobby (that he'd end up subsidizing) along with the big, intrusive antennas on our small suburban home. I don't fault Dad in this - I had two brothers, and our house was small, and I was a bit scattershot in my electronics dabbling.

[2](#)

Because they have extensive inputs and outputs designed for use by external repeater controller systems, the digital voice repeaters mentioned here could, possibly, be also retrofitted with an MMDVM that's operated in the repeater's FM mode.

[3](#)

In saying “flamp” instead of “FLAMP”, I'm using the same lowercase naming as the creator uses in the fldigi documentation. The creator says flamp, not FLAMP, and so I'll honor that.

[4](#)

Admittedly, formal scheduled nets, scheduled emergency communications exercises, and repeater networking that “creates artificial activity” are some exceptions.